POLIS (Project for Online Instructional Support): Pedagogically enhanced instructional technology

Veronica Diaz, PhC
Learning Technologies Center
The University of Arizona
vdiaz@email.arizona.edu

Duffy Gillman
Learning Technologies Center
The University of Arizona
duffy@email.arizona.edu

Abstract: POLIS (Project for Online Instructional Support) http://polis.arizona.edu/ is an online support tool for instructors that provides an instructional resource for students on a course-by-course basis. POLIS, originally created for public use at the University of Arizona in 1996, has continued to serve the online instructional support needs of higher education institutions in Arizona and other remote locations. POLIS differs from standard course management systems by featuring sound pedagogical practices embedded within its technological structure via the tools and support it provides.

Background

POLIS is a web course constriction kit that lets instructors build a course on the Worldwide Web in any subject, for immediate online delivery to students. No special training and little assistance is required to use POLIS. To build a course, the instructor visits the POLIS website (http://polis.arizona.edu/) and creates interactive web pages using the POLIS course construction kit. This kit includes resources like student-built bibliography and Webliography, support tools for student study groups and student project teams, and several varieties of discussions. Instructors may also upload their own hypertext or multimedia content and link or embed these into their POLIS course homesite.

The ease with which POLIS can be implemented and used is an important design feature of the system, but it is not its most notable feature. POLIS' most important feature or characteristic is that it allows for the creation of highly sophisticated, interactive dialogues on any topic, again without requiring any web programming skills. All resources in POLIS, but especially the interactive argumentation dialogues, aim for *substantial* interaction requiring thought and effort (Milheim, 1995-96), mostly in the form of free verbal resource to questions and arguments. At present, POLIS offers four well-defined dialogue types (in addition to a general-purpose threaded discussion format). Known as POLIS Lesson Protocols, these dialogue types are online simulations of interaction sequences know from prior research to be effective in traditional classroom settings (Jackson & Madison, 1997).

As Jackson states (1996), POLIS' uniqueness is in its pedagogically sound tools that aid in the delivery of more effective teaching and learning. For example, the Virtual Peer tool is one of a repertoire of protocols, all composed of abstract dialogue moves that can be populated with any sort of substantive content. Other protocols permit recitation, non-conclusive argumentation, and so on. Even simplistic online lessons can create profound changes in teaching and learning. Consider recitation as an instructional protocol. In class, a recitation sequence consists of a question by the teacher, one or more answers from students, and an assessment by the teacher. Online recitations expand the number of students answering, providing greater opportunity for active participation, and richer and more complete feedback to the instructor. While other course

management systems tend to concentrate on basic tools (chatboards, content organization, mail, testing, etc.), POLIS integrates sound pedagogy into appropriate tools, and provides additional resources specific to varying learning methods and styles.

One-Minute Essay

In traditional classroom settings, the one-minute essay involves simply having students write for a very short time on a topic covered in the lecture or discussion, sometimes as a way to develop materials prior to discussion and sometimes to summarize, integrate, or reflect on materials already covered. The online version has two required elements (a prompt and a student response) that can be elaborated with an optional display of student writings, shown before or after the student's own submission. As compared with the in class version, the online version has two potential advantages: its adaptability for asynchronous interaction and its automatic archiving and publication of student writings.

Recitation

A standard recitation is a question/answer/assessment sequence. Although this familiar protocol has fallen out of favor as constructivist ideas have taken hold, it remains a popular tutorial sequence. The POLIS online recitation has four elements: the question, the student's answer, a "model answer" to which the student's own answer can be compared, and a self-assessment. Like the One-Minute Essay, the Recitation protocol may include optional elements such as display of any amount of background information in text or multimedia, and it can include display of others students' writings at any point in the response sequence. As compared with an in class recitation, the online version has the advantages mentioned above, plus the advantage of allowing every student to give an independent answer to every question in a set of exercises.

Adversary

Responding to many recent calls for an increased reliance on argumentation in learning, especially in the sciences (Kuhn, 1993; Kuhn, Shaw, & Felton, 1997; Pontecorvo, 1993; Meyer & Woodruff, 1997; Zeidler, 1997), POLIS offers a simulated online debate protocol in which students are invited to stake out positions and defend them against counterarguments written by the instructor or selected from other students' writings. The Adversary protocol's elements are as follows: description of a controversy; student selection of a standpoint and preliminary defense of that standpoint; presentation of an opposing argument; student reaction to opposing argument; and student reconsideration of standpoint and explanation for changing standpoints or standing pat. Any number of opposing arguments may be presented for the student's reaction. The next revision of this protocol will also allow for review of other students' arguments on either side of the issue.

Virtual Peer

Based on Mazur's (1997) ConcepTest protocol, the Virtual Peer is an alternative format for incorporation of argumentation into courses in any subject. Mazur's protocol, as used in traditional classroom settings, has 6 distinct elements: presentation of a problem with a set of candidate answers; silent reflection by students; commitment by each individual student to one

of the candidate answers; argumentation among pairs of student trying to convince one another of the correctness of their answers; reconsideration of candidate answers; discussion of the correct solution and reasons why other candidate answers are incorrect. The online version presents the problem with a set of candidate answers; asks for the reasoning leading to the selected answer; presents contradictory reasoning favoring each unchosen alternative and asks how the student would respond to a classmate reasoning in this way; presents the candidate answers for reconsideration and asks for reasoning supporting the student's new answers; and finally presents the correct solution. The online version sacrifices live interaction with peers, but improves on the live version by assuring that every student will have to respond to reasoning that differs from his or her own and by assuring that this reasoning will present significant intellectual challenges.

Conclusion

POLIS was designed to make teaching on the web as easy as possible and to work well within the ordinary preparation and planning practices of instructors. The authoring tools are available to instructors 24 hours a day from any point of access to the internet, and they make instructors completely autonomous web publishers, independent of consultants, network administrators, programmers, or other support staff. Ease of use and ubiquitous availability to the instructor is crucial to the usefulness of the system as a platform for disseminating current knowledge about teaching and learning and as a device for gathering new data on what is effective.

Instructors come to POLIS for the authoring tools; but in using the tools, they learn about new teaching strategies and they contribute information automatically that helps refine our knowledge about teaching practice and learner outcomes. Students come to POLIS for the lessons and other resources, but in doing their work, they too contribute data that we use for evaluation of the tools themselves. This interweaving of instructional support and instructional assessment allows us to build a self-correcting system whose development directions emerge constantly from examination of teaching practices and learning outcomes.

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